

3.1 WATER QUALITY SUMMARY OF REACH I

Basin Reach I is located on the main stem of the Red River and represents a watershed from the Texas-Arkansas state-line upstream to the confluence of Cache Creek and Red River (Bowie County to Montague County). There are five subwatersheds in this reach totaling 7,698 square miles of contributing drainage area in Texas, Arkansas and Oklahoma; 3,600 square miles in Texas.

Three classified stream segments (0201, 0202, 0204) and five classified water bodies (0203, 0208, 0209, 0210, 0225) are in this reach. There are 53 permitted municipal and industrial dischargers, 15 permitted solid waste disposal sites, about 1,595 petroleum storage tanks, three confined animal feeding operations, and approximately 231,857 persons located in this reach. Twenty water quality monitoring stations (10 routine and 10 systematic) provided data for screening during this period. The Authority conducted 40 monitoring events and 926 parameters were screened and analyzed against the surface water quality stream standards or established screening criteria.

Fecal coliform was the only parameter that exceeded the screening criteria in this basin reach. Stream segments 0201, 0202, 0203, and 0204 all exhibited elevated levels of fecal coliform in this and previous assessments. Refer to **Table 3** for a statistical summary of parameters exceeding the screening criteria.

Nutrients appeared to be on the decline and none exceeded the screening criteria. There were insufficient data to screen metals. Dissolved solids were reported below the standards, but showed an increasing trend in concentrations during the latter part of the period, probably due to drought conditions.

Segments 0202D (Pine Creek in Lamar County), 0203A (Big Mineral Creek in Grayson County) and 0204 (Red River above Denison Dam) have all been included on the CWA §303(d) list as impaired water bodies due to elevated levels of fecal coliform bacteria.

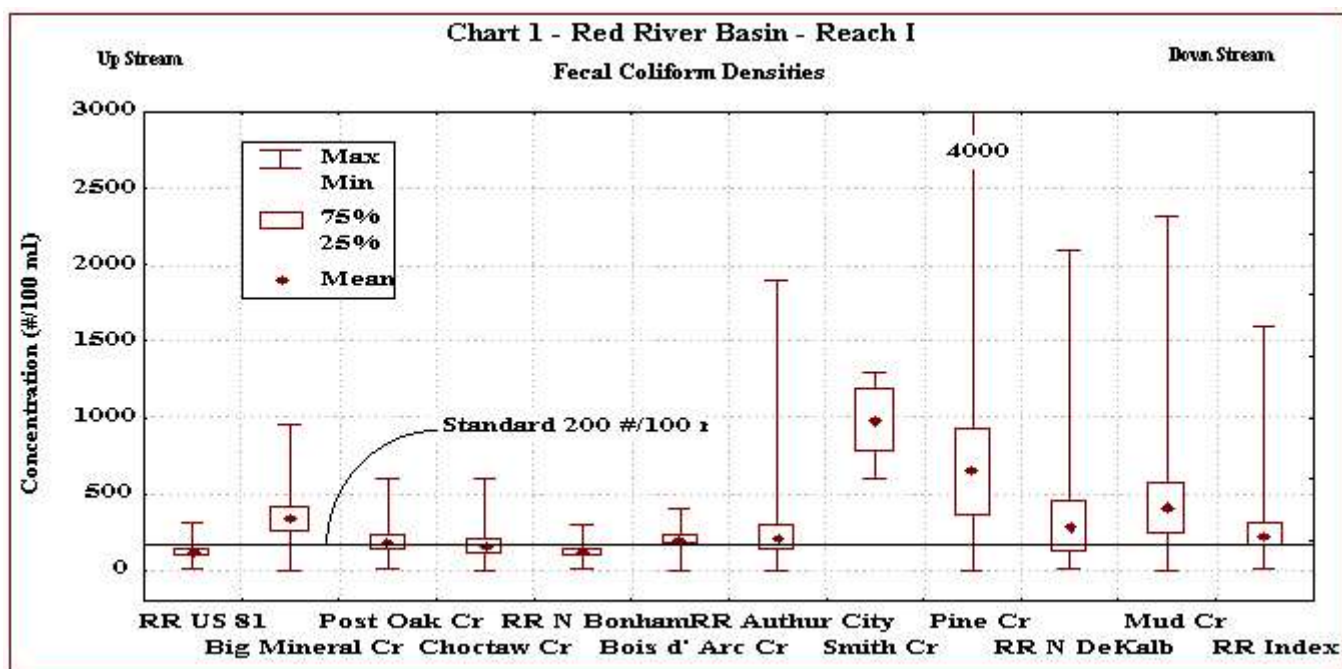
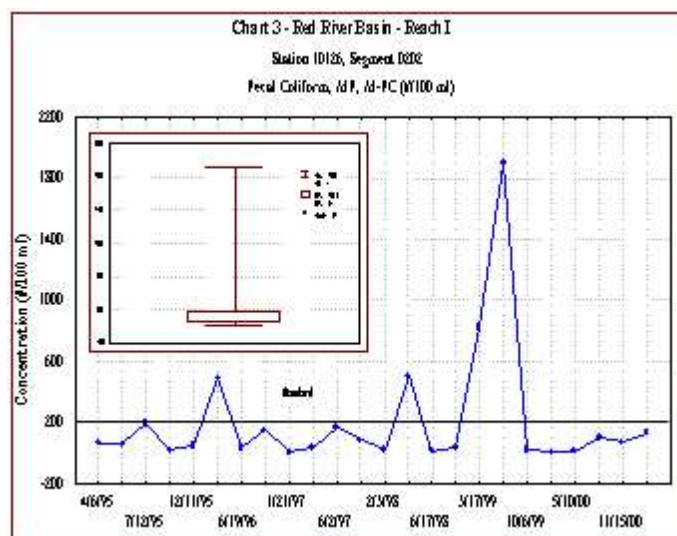
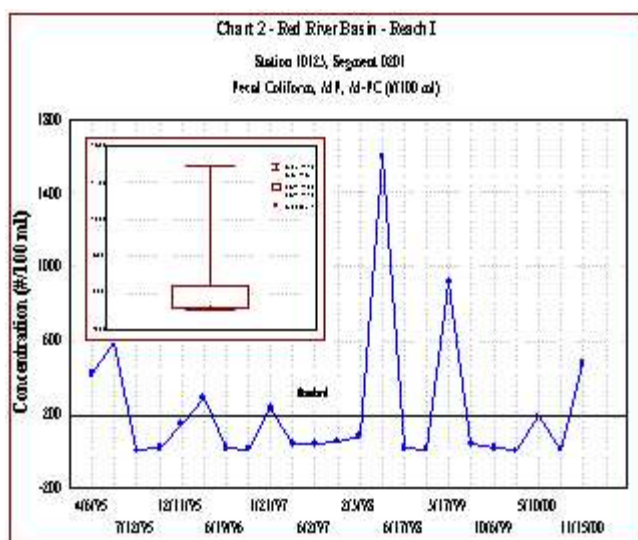


Chart 1 shows stations located in Red River Basin Reach I, more specifically in stream segments 0201, 0202, 0203 and 0204 that exhibited elevated levels of fecal coliform over the past five years. Further analysis of the data revealed that the elevated levels correlated with flow, temperature and rainfall events. This is indicative of storm water runoff from agricultural areas and probably the primary contributing factors for the exceedances.

Pine Creek in Lamar County (segment 0202D) is included on the CWA §303(d) list of impaired water bodies with pathogens, namely fecal coliform, as the parameter of concern (10118). Further investigations and supplemental sampling within the area have revealed that the fecal load is originating from Smith Creek (17044), a tributary of Pine Creek which drains the northwest section of the City of Paris' industrial district. A special study is planned for the ensuing year to locate the source of the elevated fecal concentrations and develop a corrective action plan.



Charts 2, 3 and 4 depict the levels of fecal coliform over time for the stations exceeding the Surface Water Quality Stream Standards. The highs or peak concentrations tend to correlate well with rainfall events and flow for each occurrence.

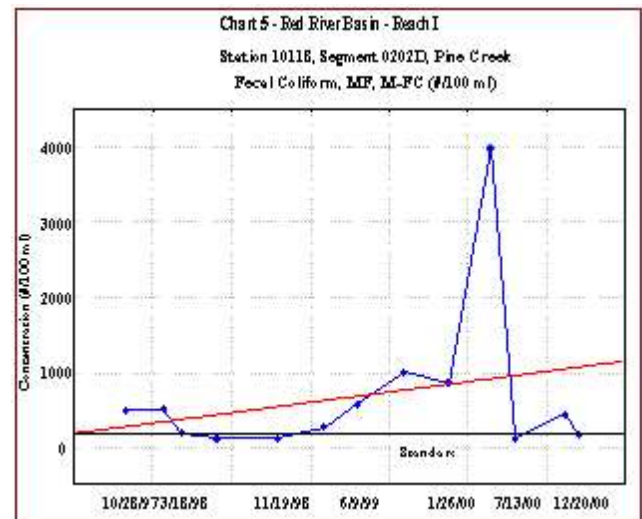
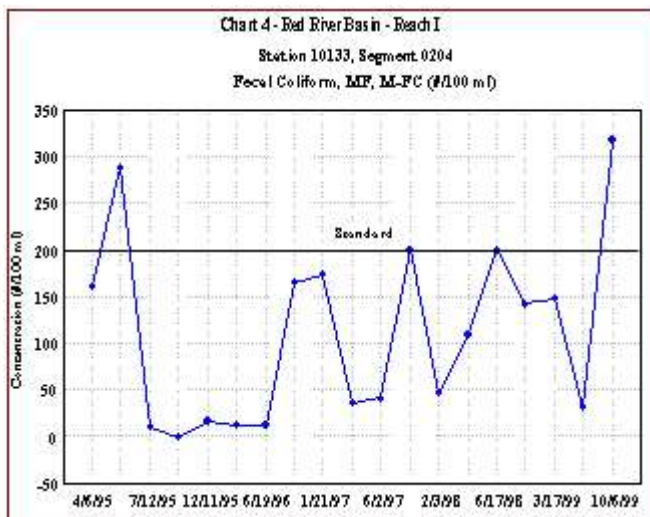


Chart 5 depicts the elevated levels of fecal coliform at station 10118 on Pine Creek. There were insufficient data on station 17044 located on Smith Creek for analysis. However, the magnitude and frequency of present samples correlate within a reasonable lag time with that of Pine Creek. The two stations show a definite comparison which correlates with stream flows. Smith Creek flows into Pine Creek in Lamar County north of Paris, Texas.

A linear regression and normal probability analysis were performed on each segment/station exceeding the standard for fecal coliform, but no apparent trends were detected over the last five to eight years. In most cases, peak levels of fecal coliform appear to be originating from storm water runoff of predominately agricultural practices within each subwatershed, with the exception of segment 0203 (Lake Texoma).

The elevated fecal densities are believed to be originating from septic tank areas around the perimeter of the reservoir in both Texas and Oklahoma, and possibly unauthorized discharge of waste from boats. A joint special study sponsored by the Texas Water Development Board (TWDB) and Oklahoma Water Resources Board (OWRB) is currently in progress to validate this assumption and develop plans for possible resolution of the problem. Additionally, the CRP is proposing additional monitoring of tributaries entering Lake Texoma to help identify the source of the elevated fecal densities.

RED RIVER BASIN

FACTORS INFLUENCING WATER QUALITY

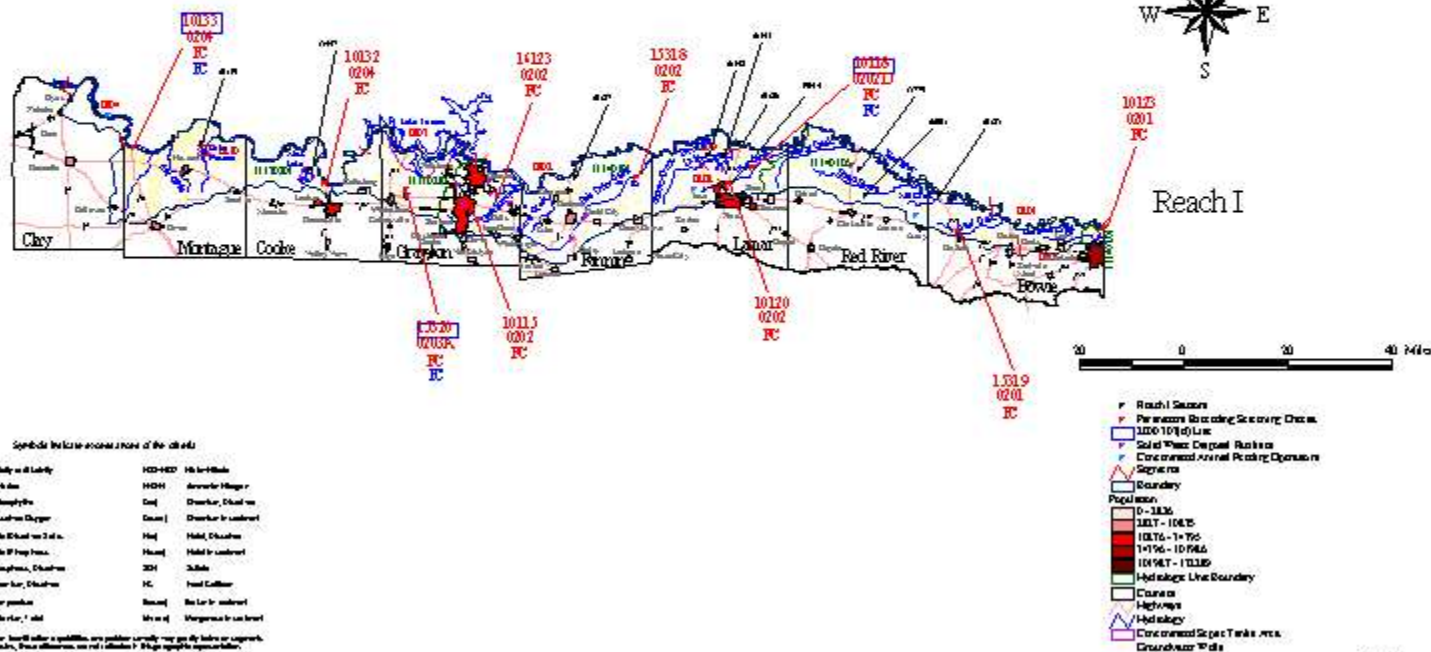


Figure 1